

REMARKS

Applicant respectfully requests reconsideration. Claims 14, 18, 19, and 25-28 were previously pending in this application. By this amendment, Applicant is amending claim 14. New claim 29 has been added. Support for this claim can be found, for example, on page 7, lines 22-27 of the application as filed. As a result, claims 14, 18, 19, and 25-29 are pending for examination with claim 14 being an independent claim. No new matter has been added.

Rejections Under 35 U.S.C. §103

1. Claims 14, 18-19, and 25-28 are rejected under 35 U.S.C. §103(a) as being unpatentable over Brooke et al. (US Patent 6,328,992) in view of Travis (US Patent 6,541,510) and Turner (J Clin Pharmacol 1981; 21: 283S-291S). Applicant respectfully requests reconsideration of the claims as amended.

The Examiner continues to maintain that “it would have been obvious to a person of ordinary skill in the art at the time of the invention, to treat mood disorders such as depression with cannabichromene compounds because of the teachings of Brooke et al. that cannabichromenes are useful in treating such disorders as depression” (Office Action at page 6). Applicant respectfully disagrees and requests reconsideration of this rejection. Brooke et al. does not teach compositions containing greater than or equal to 30% CBC for treating any specific disease or disorder, let alone the specific mood disorders recited in the instant claims. Moreover, the skilled person would not have had a reasonable expectation of success in using CBC to treat mood disorders.

Nonetheless, to expedite prosecution, and without conceding the correctness of the rejection, Applicant has amended claim 1 to recite a method of treating depression in a human patient by administering 0.1 to 1000 mg of CBC. Support for this amendment can be found, for example, on page 8, lines 29-34.

The cited prior art does not provide all of the elements of the claimed invention

The prior art cited by the Examiner lacks at least three elements recited in the amended claims. First, as acknowledged by the Examiner on page 4 of the Office Action, Brooke et al. does not teach that cannabichromene (CBC) is present as more than 30% of the cannabinoids in the composition, as instantly claimed. Travis et al. discloses CBC containing compositions, but does not teach that CBC is present as more than 30% of the cannabinoids in the compositions. The Examiner asserts that it would have been obvious “that the CBC amount would be higher because of the teachings of Turner that CBC is the major cannabinoid in freshly harvested drug-type cannabis material, which would make the amount of 30% obvious”. Applicant respectfully disagrees and maintains that CBC is not abundant in most mature cannabis plants.

A sampling of the cannabinoid composition during the life cycle of several cannabis plants reveals that the proportion of CBC in the total cannabinoid fraction decreases with ageing of the plant (see, e.g., Table 1 of Vogelmann et al., J. Nat. Prod., 1988, 51 (6), pp 1075–1079, cited in the Information Disclosure Statement dated June 5, 2008; and pages 19-20 and Figures 3A-C of WO 2009/125198, cited in the Information Disclosure Statement dated April 7, 2010). Vogelmann et al. clearly discloses that, in the flowering plant, (the cannabinoids predominate in the flowering heads) CBC is found in relatively small amounts (127 µg CBC v. 3575 µg THC), far below 30% of the cannabinoids. Accordingly, the use of a plant extract comprising greater than or equal to 30% CBC for treating depression is not obvious.

The Examiner states that the above argument is not persuasive because “While it is understood that CBC decreases in certain types of mature plant types, this is not the case in all plant types, as is evidenced Harvey” (Office Action at page 2). Harvey does not provide any evidence on the levels of CBC during the life cycle of cannabis plants. Harvey simply states that “in some drug strains of the plant, developed for high content of the major psychoactive constituent, delta-9-tetrahydrocannabinol (delta-9-THC), this compound has been reported as the second most abundant cannabinoid” (Harvey et al. at page 275, first paragraph). There is no teaching or suggestion in Harvey et al. that the amount of CBC in some cannabinoid plants is greater than or equal to 30% of

the total cannabinoid content. Accordingly, the use of a plant extract comprising greater than or equal to 30% CBC for treating depression is not obvious.

Second, the cited art does not teach or suggest the administration of 0.1 to 1000 mg of CBC for the treatment of depression. The claimed amount refers to the amount of CBC administered per dosage form. None of the cited references disclose or suggest the instantly claimed amount of CBC for the treatment of depression.

Third, Brooke et al. does not teach that CBC is useful for treating depression. According to the Examiner "it is clear that CBC contributes to the medicinal effects of which include stress and depression" (Office Action as page 3). Merely because cannabis is taught to have a number of medicinal uses, and CBC is listed as one of the active ingredients (though not the "primary" active ingredient), it does not follow that CBC is useful for treating all indications mentioned in Brooke. Brooke et al. makes no comment on the activity of each of the specified ingredients of cannabis, and thus the person of ordinary skill in the art would not obtain any reason or direction from Brooke to use CBC for treating any particular disorder, let alone for treating depression as recited in the instant claims.

Established case law states that "[A] patent composed of several elements is not proved obvious merely by demonstrating that each element was, independently, known in the prior art". KSR Int'l v. Teleflex Inc., 82 USPQ2d 1385, 1396 (2007). "The fact that a claimed product is within the broad field of the prior art and one might arrive at it by selecting specific items and conditions does not render the product obvious in the absence of some directions or reasons for making such selection." Ex parte Kuhn, 132 USPQ2d 1958 (Bd App 1961). Furthermore, the Examiner is not entitled to use the claim as a "frame" and to employ "individual, naked parts of separate prior art references...as a mosaic to recreate a facsimile of the claimed invention." W. L. Gore & Assoc., Inc. v. Garlock, Inc., 721 F.2d 1540, 1552 (Fed. Cir., 1984). The combination of Brooke et al., Turner and Travis does not provide any reason or direction to the skilled person to select both CBC and depression with the expectation that CBC would be effective in treating such

disorders. Further, there is no reason or direction that a skilled person could take from this combination of references to use CBC that is substantially pure or is an extract from a cannabis plant that contains greater than or equal to 30% CBC of the total cannabinoid content.

There are dozens of cannabinoids known in cannabis (see, e.g., Wikipedia entry at [<http://en.wikipedia.org/wiki/Cannabinoid>]; copy submitted to the Office on September 11, 2009). In particular, this document shows the existence of 67 cannabinoids (see “Table of natural cannabinoids” at pages 7-10) and reports on page 2 that “At least 66 cannabinoids have been isolated from the cannabis plant (see page 2, citing to reference 4, Burns and Ineck, *Annals Pharmacother.*, 40:251-260, 2006). Absent some teaching pointing to the use of specific cannabinoids for treating depression, the skilled person would not have known which one or more cannabinoids would be useful in treating depression as recited in the claims and would not have had a reasonable expectation of success in randomly selecting cannabinoids to try.

The MPEP states that the fact that a claimed species or subgenus is encompassed by a prior art genus is not sufficient by itself to establish a prima facie case of obviousness. MPEP § 2144.08 II, citing *In re Baird*, 16 F.3d 380, 382, 29 USPQ2d 1550, 1552 (Fed. Cir. 1994). Therefore, absent some reason or direction in the prior art that CBC in particular is useful for treating depression as recited in the amended claims, the claims cannot be obvious in view of the cited art.

Motivation to combine the cited references and a reasonable expectation of success are absent

Applicant had presented evidence which suggested that cannabis was responsible for mental health problems (Whittle Declaration, paragraphs 5-6, and 11c; BBC news article at [<http://news.bbc.co.uk/2/hi/health/2923647.stm>]; Rey et al. *Br J Psychiatry*. 2002 Mar;180:216-21). The skilled person would not have been motivated to make the claimed invention due to the link between cannabis and depression as established by the submitted evidence.

The Examiner cites Chen et al. (*Soc. Psychiatry Psychiatr Epidemiol* (2002) 37: 199-206) in support of the contention that there is discrepancy within the art concerning the link between

depression and marijuana use. Chen et al., in fact, supports Applicant's contention that cannabis is responsible for mental health problems. Chen et al. found that non-dependent marijuana users had 1.6 times greater risk of Major Depressive Episode (MDE) even with statistical adjustment for sex, birth cohorts, alcohol dependence, and history of daily tobacco smoking (Chen et al., Abstract).

As acknowledged by the Examiner on page 4 of the Office Action "the main finding of their study is that marijuana use and marijuana dependence signal no more than a moderately increased risk of major depression". Even if the risk of major depression is only moderately increased, a person of skill in the art would have no reason or motivation to use CBC to treat depression. The skilled person would not have had a reasonable expectation of success in using CBC to treat depression. In fact, given the link between cannabis and depression, Applicant submits that the skilled artisan would have been prejudiced against selecting any cannabinoid, including CBC, to use as a medicine to treat depression.

Thus, the combination of cited art does not provide the elements of the claimed invention, does not provide the requisite motivation to combine the cited references, does not provide the skilled person with a reason to use CBC in the claimed methods, and does not provide a reasonable expectation of success in doing so. Accordingly, withdrawal of this rejection is respectfully requested.

2. Claims 14, 18-19, and 25-28 are rejected under 35 U.S.C. §103(a) as being unpatentable over Whittle et al. (US Pub 2005/0042172) in view of Turner et al. (J Clin Pharmacol 1981; 21: 283S-291S).

The cited prior art does not provide all of the elements of the claimed invention

The prior art cited by the Examiner lacks at least three elements recited in the instant claims as amended. First, as acknowledged by the Examiner on page 7 of the Office Action, Whittle et al. does not teach that cannabichromene (CBC) is present as more than 30% of the cannabinoids in the composition, as instantly claimed. The Examiner asserts that "Turner teaches that CBC is one of

the most abundant naturally occurring cannabinoids; therefore, it would be obvious that the content of CBC would be higher to treat a mood disorder.” Applicant respectfully disagrees and maintains that the level of CBC is very low in mature plants and certainly lower than the claimed amount.

As discussed above, the use of a plant extract comprising greater than or equal to 30% CBC for treating a mood disorder is not obvious. CBC is not abundant in most mature cannabis plants and a sampling of the cannabinoid composition during the life cycle of several cannabis plants reveals that the proportion of CBC in the total cannabinoid fraction decreases with ageing of the plant (see, e.g., Table 1 of Vogelmann et al., J. Nat. Prod., 1988, 51 (6), pp 1075–1079, cited in the Information Disclosure Statement dated June 5, 2008; and pages 19-20 and Figures 3A-C of WO 2009/125198, cited in the Information Disclosure Statement dated April 7, 2010). Vogelmann et al. clearly disclose that, in the flowering plant, (the cannabinoids predominate in the flowering heads) CBS is found in relatively small amounts (127 µg CBS v. 3575 µg THC). Most cannabis plants are bred specifically for high and predominant THC content, and as a result, the second most abundant cannabinoid in most mature cannabis plants may comprise less than 2% of the total cannabinoids. Accordingly, the use of a plant extract comprising greater than or equal to 30% CBC for treating depression is not obvious.

Moreover, Harvey (as referred to by the Examiner on page 2 of the Office Action) does not provide any evidence on the levels of CBC during the life cycle of cannabis plants. Harvey simply states that “in some drug strains of the plant, developed for high content of the major psychoactive constituent, delta-9-tetrahydrocannabinol (delta-9-THC), this compound has been reported as the second most abundant cannabinoid” (Harvey et al. at page 275, first paragraph). There is no teaching or suggestion in Harvey et al. that the amount of CBC in some cannabinoid plants is greater than or equal to 30% of the total cannabinoid content. Accordingly, the use of a plant extract comprising greater than or equal to 30% CBC for treating depression is not obvious.

Second, the cited art does not teach or suggest the administration of 0.1 to 1000 mg of CBC for the treatment of depression as recited in the amended claims. The claimed amount refers to the

amount of CBC administered per dosage form. None of the cited references disclose or suggest the instantly claimed amount of CBC for the treatment of depression.

Third, Whittle et al. does not link any specific cannabinoid to treatment of depression, and more importantly, does not link the use of CBC to treatment of depression. According to the Examiner “Whittle teaches therapeutic extracts of cannabis (paragraph 0052). Therefore, Whittle does teach that one of the therapeutic substances of the invention includes CBC and that the extracts are useful in the methods of treating depression (paragraph 0056)” (Office Action at page 4). Merely because compositions comprising cannabis extracts are taught to have a number of medicinal uses, it does not follow that CBC is useful for treating all disclosed indications let alone for treating depression, which is not specifically described in Whittle et al.

Moreover, as discussed above, established case law states that “[A] patent composed of several elements is not proved obvious merely by demonstrating that each element was, independently, known in the prior art”. KSR Int’l v. Teleflex Inc., 82 USPQ2d 1385, 1396 (2007). “The fact that a claimed product is within the broad field of the prior art and one might arrive at it by selecting specific items and conditions does not render the product obvious in the absence of some directions or reasons for making such selection.” Ex parte Kuhn, 132 USPQ2d 1958 (Bd App 1961). Furthermore, the Examiner is not entitled to use the claim as a “frame” and to employ “individual, naked parts of separate prior art references...as a mosaic to recreate a facsimile of the claimed invention.” W. L. Gore & Assoc., Inc. v. Garlock, Inc., 721 F.2d 1540, 1552 (Fed. Cir., 1984). The combination of Whittle et al. and Turner does not provide any reason or direction to the skilled person to select both CBC and mood disorders with the expectation that CBC would be effective in treating such disorders. Further, there is no reason that a skilled person could take from this combination of references to use CBC that is substantially pure or is an extract from a cannabis plant that contains greater than or equal to 30% CBC of the total cannabinoid content.

Indeed, as indicated above, at least 66 different cannabinoids have been isolated from the cannabis plant, and there is no expectation that each of these cannabinoids can treat all disclosed

indications. Absent some teaching pointing to specific cannabinoids, the skilled person would not have known which one or more cannabinoids would be useful in treating depression as recited in the amended claims.

Motivation to combine the cited references and a reasonable expectation of success are absent

Applicant had presented evidence which suggested that cannabis was responsible for mental health problems (Whittle Declaration, paragraphs 5-6, and 11c; BBC news article at [<http://news.bbc.co.uk/2/hi/health/2923647.stm>]; Rey et al. Br J Psychiatry. 2002 Mar;180:216-21). As discussed above, Chen et al. cited by the Examiner supports Applicant's contention that cannabis is responsible for mental health problems. Chen et al. found that non-dependent marijuana users had 1.6 times greater risk of Major Depressive Episode (MDE) even with statistical adjustment for sex, birth cohorts, alcohol dependence, and history of daily tobacco smoking (Chen et al., Abstract).

As acknowledged by the Examiner on page 4 of the Office Action "the main finding of their study is that marijuana use and marijuana dependence signal no more than a moderately increased risk of major depression". Even if the risk of major depression is only moderately increased, a person of skill in the art would have no reason or motivation to use CBC to treat depression. The skilled person would not have had a reasonable expectation of success in using CBC to treat depression. In fact, it is certain given the link between cannabis and depression that the skilled artisan would have been prejudiced against selecting any cannabinoid, including CBC, to use as a medicine to treat depression.

Thus, the combination of cited prior art does not provide the elements of the claimed invention, does not provide the requisite motivation to combine the cited references, does not provide the skilled person with a reason to use CBC in the claimed methods, and does not provide a reasonable expectation of success in doing so. Accordingly, withdrawal of this rejection is respectfully requested.

Double Patenting Rejection

Claims 14, 18-19, and 25-28 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 3, 5, 12, and 14 of copending Application No. 11/760,364.

The claims in US 11/760,364 recite administration of an entirely different cannabinoid, cannabigerol (CBG), which is structurally different than the compound recited in the claims as amended of the instant application (see e.g., Table showing main classes of natural cannabinoids of Wikipedia entry at [<http://en.wikipedia.org/wiki/Cannabinoid>]; copy submitted to the Office on September 11, 2009). Applicant maintains that the use of CBC for treating mood disorders is not obvious in view of the use of CBG in US 11/760,364.

MPEP § 2144.09 states that “[a]n obviousness rejection based on similarity in chemical structure and function entails the motivation of one skilled in the art to make a claimed compound, in the expectation that compounds similar in structure will have similar properties.’ In re Payne, 606 F.2d 303, 313, 203 USPQ 245, 254 (CCPA 1979). See In re Papesch, 315 F.2d 381, 137 USPQ 43 (CCPA 1963)”. However, where the compounds are dissimilar in structure, such as in the case of CBC and CBG, there is no expectation that the compounds will have similar properties. Thus, the use of CBC for treating mood disorders is not obvious in view of the use of CBG in US 11/760,364.

Accordingly, reconsideration and withdrawal of this rejection is respectfully requested.

CONCLUSION

A Notice of Allowance is respectfully requested. The Examiner is requested to call the undersigned at the telephone number listed below if this communication does not place the case in condition for allowance.

If this response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicant hereby requests any necessary extension of time. If there is a fee occasioned by this response, including an extension fee, the Director is hereby authorized to charge any deficiency or credit any overpayment in the fees filed, asserted to be filed or which should have been filed herewith to our Deposit Account No. 23/2825, under Docket No. H0664.70032US00.

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Respectfully submitted,

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